REMARKS

Claims 1-5, 11, 13 and 15, as amended, remain herein. Claims 6-10, 12, 14 and 16 also remain herein but are presently withdrawn. Claim 1 has been amended. Support for the amendment may be found throughout the specification (see, e.g., Sample 17 at Table 1, pages 15-16 of the specification).

1. Claims 1-5, 11, 13 and 15 were rejected under 35 U.S.C. § 112, second paragraph. Claim 1 has been amended to moot this rejection.

2. Claims 1, 2, 11, 13 and 15 were rejected under 35 U.S.C. § 103(a) over Yasuda et al. US Patent 6,372,059.

Applicants' claim 1 now recites a low Co hydrogen storage alloy having a $CaCu_5$ crystal structure represented by the general formula $MmNi_aMn_bAl_cCo_d$, wherein Mm is a Misch metal, $4.31 \leq a \leq 4.7$, $0.3 \leq b \leq 0.65$, $0.2 \leq c \leq 0.5$, $0 < d \leq 0.35$, $5.2 \leq a + b + c + d \leq 5.5$, wherein the a-axis length of the crystal lattice of said $CaCu_5$ crystal structure is 499 pm or more, and the c-axis length is 405 pm or more.

Yasuda does not teach or suggest applicants' claimed low Co hydrogen storage alloy, represented by the general formula $MmNi_aMn_bAl_cCo_d$, wherein $4.31 \leq a \leq 4.7$. In Yasuda, $4.0 < a \leq 4.3$ (see Yasuda at abstract). In addition, Yasuda teaches away from applicants' claimed invention:

> As described above, the ratio of Ni, a, is from 4.0 to 4.3, desirably from 4.1 to 4.2. If a is less than 4.0, the discharge characteristics are not satisfactory. If it exceeds 4.3, deterioration in insusceptibility to grain size reduction or life characteristics is observed.

Yasuda column 3, lines 12-16 (emphasis added here).

Thus, Yasuda does not disclose all elements of applicants' claims, and does not disclose anything that would have suggested applicants' claimed invention to one of ordinary skill in the art. Further, there is no disclosure or teaching in Yasuda or otherwise in this record that would have suggested the desirability of combining any portions thereof effectively to anticipate or suggest applicants' presently claimed invention. Applicants respectfully request reconsideration and withdrawal of this rejection.

3. Claims 1-5, 11, 13 and 15 were rejected under 35 U.S.C. § 103(a) over Kaneko et al. US Patent 6,261,517.

Applicants' claim 1 recites a low Co hydrogen storage alloy having a $CaCu_5$ crystal structure that can be represented by the general formula $MmNi_aMn_bAl_cCo_d$, wherein Mm is a Misch metal, $4.31 \leq a \leq 4.7$, $0.3 \leq b \leq 0.65$, $0.2 \leq c \leq 0.5$, $0 < d \leq 0.35$, $5.2 \leq a + b + c + d \leq 5.5$, wherein the a-axis length of the crystal lattice of said $CaCu_5$ crystal structure is 499 pm or more, and the c-axis length is 405 pm or more.

Kaneko says nothing about a low Co hydrogen storage alloy having a $CaCu_5$ crystal structure, wherein the a-axis length of the crystal lattice of said $CaCu_5$ crystal structure is 499 pm or more, and the c-axis length is 405 pm or more.

Contrary to the assertion in the Office Action, the a-axis and c-axis lengths of the crystal lattice are not inherent properties of the crystal composition and structure but depend upon various factors. Applicants' specification explains that:

> For example, a hydrogen storage alloy can be manufactured by weighing and mixing materials for the hydrogen storage alloy, casting the mixture, and carrying out heat treatment. At this time, the a-axis length and c-axis length of the crystal lattice can be adjusted in a predetermined range by suitably selecting and controlling manufacturing conditions, such as casting conditions (casting method, casting temperature, cooling rate, etc.) and heat-treatment conditions, according to the alloy composition. In general, the c-axis length of the crystal lattice can be increased by increasing the cooling rate in casting, and the c-axis length of the crystal lattice can also be increase by raising the heat-treatment temperature. However, since the c-axis length of the crystal lattice in some alloy species is increase even if the heat-treatment temperature is low, these must be suitably controlled according to the alloy species.

Applicants' specification, page 12, line 25 to page 13, line 2 (emphasis added here). See also the enclosed Suzuki et al. article at FIG. 6 showing the variation of the a-axis and c-axis lengths with temperature.

Applicants use specific heat and cooling conditions to achieve applicants' claimed a-axis length and c-axis length of the crystal lattice (compare the heat and cooling conditions in applicants' Table 2 to those of Kaneko's Table 1). Thus, the a-axis and c-axis lengths of the crystal lattice are not merely inherent properties of the crystal composition and structure. In addition, the a-axis and c-axis lengths of the crystal lattice are key to achieve applicants' superior hydrogen storage alloy having high durability:

> It was known from the results of FIG. 1 and Table 2 that when the a-axis length and c-axis length were within predetermined ranges, all of activity, drain (power) performance and life performance were improved. Above all, Samples 2, 17, 22 and 24 were evaluated as being excellent especially in activity, drain (power) performance and life performance. When Samples 31 to 33 were noted, it was found that all of activity, drain (power) performance and life performance were improved, and life performance was particularly excellent, even with iron (Fe) contained. Furthermore, it was found that when the quantity of cooling water was increased, specifically when the cooling rate was raised, there was tendency for the c-axis length to increase and for the life performance to improve.

Applicants' specification, page 22, lines 4-13.

For all the foregoing reasons, claims 1-5, 11, 13 and 15 are now proper in form and patentably distinguished over all grounds of rejection cited in the Office Action. The PTO is hereby authorized to charge or credit any necessary fees to Deposit Account No. 19-4293. Should the Examiner deem that any further amendments would be desirable in placing this application in even better condition for issue, he is invited to telephone applicants' undersigned representative.

Respectfully submitted,

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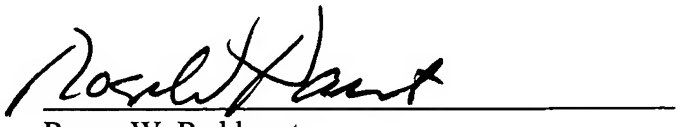

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